IN THE CLAIMS:

The status and content of each claim follows. ***No amendments to the claims are proposed by the present paper.***

1. (original) A method of reducing a gray scale discontinuity between pixel locations in a blackened state on a contrast enhancing screen and pixel locations in a gradual shading region of an image displayed by a projector on said contrast enhancing screen, said discontinuity caused by ambient light, said method comprising:

measuring an intensity of said ambient light;

comparing said measured ambient light intensity to an average intensity of light projected by said projector onto said gradual shading region; and

generating apparent gray scale levels for pixels to be displayed in said pixel locations in said gradual shading region based on said comparison.

2. (original) The method of claim 1, further comprising:

selecting a dithering algorithm based on said comparison;

wherein said step of generating said apparent gray scale levels uses said dithering algorithm to generate said apparent gray scale levels for said pixels to be displayed in said pixel locations in said gradual shading region.

3. (original) The method of claim 1, wherein said step of generating said apparent gray scale levels for said pixels to be displayed in said pixel locations in said gradual shading region comprises:

spatially and temporally dithering pixel blocks during a number of frame periods, each of said pixel blocks comprising a plurality of said pixels to be displayed in said pixel locations in said gradual shading region;

wherein said spatial and temporal dithering of said pixel blocks generates an apparent gray scale level for each of said pixel blocks.

4. (original) The method of claim 3, wherein, during each of said number of frame periods, said step of spatially and temporally dithering said pixels comprises activating one or more of said plurality of pixel locations in each of said pixel blocks.

5. (original) The method of claim 3, wherein said pixel blocks each comprise four pixels.

6. (original) The method of claim 3, wherein said number of frame periods is equal to two.

7. (original) A method of operating a light engine configured to project light onto a group of pixel locations of a viewing surface during a time period, said method comprising:

estimating an ambient light energy received by said group of pixel locations during said time period;

determining a threshold gray scale level of the light engine; and

dithering pixels having gray scale levels at or below said threshold gray scale level to be displayed in said group of pixel locations if said estimated ambient light energy is greater than or substantially equal to said threshold gray scale level.

8. (original) The method of claim 7, further comprising measuring an ambient light intensity, wherein said step of estimating said ambient light energy is based on said measured ambient light intensity.

9. (original) The method of claim 7 wherein said time period is one or more frame periods.

10. (original) The method of claim 7, wherein said time period is a portion of a frame period.

11. (original) The method of claim 7, wherein said step of dithering said pixels comprises spatially and temporally dithering pixel blocks during said time period, each of said pixel blocks comprising a plurality of said pixels to be displayed in said group of pixel locations.

12. (original) A method of operating a light engine configured to generate and display an image on a viewing surface, said image formed by pixels having varying gray scale levels, said method comprising:

generating an estimate of an ambient light intensity level; and

selecting between half-toning and dithering to generate said gray scale levels for each of said pixels in response to said estimated ambient light level.

13. (original) The method of claim 12, wherein said step of generating said estimate of said ambient light intensity level comprises measuring said ambient light intensity level with an ambient light sensor and transferring said measured ambient light intensity level to said light engine.

14. (original) The method of claim 12, further comprising selecting a threshold gray scale level, wherein said dithering is selected to generate said gray scale levels for each of said pixels that is to have a gray scale level at or below said threshold gray scale level if said estimated ambient light energy is greater than or substantially equal to said threshold gray scale level.

15. (original) The method of claim 14, wherein said half-toning is selected to generate said gray scale levels for each of said pixels if said estimated ambient light energy is less than said threshold gray scale level.

16. (original) The method of claim 14, wherein said dithering comprises spatially and temporally dithering pixel blocks during a number of frame periods, each of said pixel blocks comprising a plurality of said pixels.

17. (original) A system for reducing a gray scale discontinuity between pixel locations in a blackened state on a contrast enhancing screen and pixel locations in a gradual

shading region of an image displayed by a projector on said contrast enhancing screen, said discontinuity caused by ambient light, said system comprising:

an ambient light sensor configured to measure an intensity of said ambient light;

an image processing unit configured to compare said measured ambient light intensity to an average intensity of light projected by said projector onto said gradual shading region; and

a spatial light modulator configured to generate apparent gray scale levels for pixels to be displayed in said pixel locations in said gradual shading region based on said comparison.

18. (original) The system of claim 17, wherein said image processing unit is further configured to select a dithering algorithm based on said comparison and said spatial light modulator is further configured to use said dithering algorithm to generate said apparent gray scale levels for said pixels to be displayed in said pixel locations in said gradual shading region.

19. (original) The system of claim 17, wherein said spatial light modulator is configured to generate apparent gray scale levels for said pixels to be displayed in said pixel locations in said gradual shading region by spatially and temporally dithering pixel blocks during a number of frame periods, each of said pixel blocks comprising a plurality of said pixels to be displayed in said pixel locations.

20. (original) The system of claim 19, wherein said pixel blocks each comprise four pixels .

21. (original) The system of claim 19, wherein said number of frame periods is equal to two.

22. (original) The system of claim 17, wherein said spatial light modulator is selected from the group consisting of an analog based light modulator, a pulse-width modulation based light modulator, a liquid crystal display (LCD) panel, a liquid crystal on silicon (LCOS) device, a diffractive light device (DLD), and an array of micromirrors.

23. (original) A light engine for displaying an image having a gradual shading region on a contrast enhancing screen, said light engine comprising:

a spatial light modulator configured to generate gray scale levels for pixels in said image;

projector optics configured to project light comprising said image onto said contrast enhancing screen, said projected light having an intensity; and

an ambient light sensor configured to measure an intensity of ambient light reflecting off pixel locations in said contrast enhancing screen corresponding to said gradual shading region;

wherein said spatial light modulator reduces a gray scale discontinuity caused by said ambient light between pixel locations in a blackened state on said contrast enhancing screen and said pixel locations in said gradual shading region by generating apparent gray scale levels for said pixels to be displayed in said pixel locations in said gradual shading region based on a comparison between said measured ambient light intensity and said projected light intensity.

24. (original) The system of claim 23, wherein said light engine further comprises:

an image processing unit configured to select a dithering algorithm based on said comparison;

wherein said spatial light modulator is further configured to use said dithering algorithm to generate said gray scale levels for said pixels to be displayed in said pixel locations in said gradual shading region.

25. (original) The system of claim 24, wherein said dithering algorithm comprises spatially and temporally dithering pixel blocks during a number of frame periods, each of said pixel blocks comprising a plurality of said pixels to be displayed in said pixel locations in said gradual shading region.

26. (original) The system of claim 25, wherein said number of frame periods is equal to two.

27. (original) The system of claim 24, wherein said spatial light modulator is selected from the group consisting of an analog based light modulator, a pulse-width modulation based light modulator, a liquid crystal display (LCD) panel, a liquid crystal on silicon (LCOS) device, a diffractive light device (DLD), and an array of micromirrors.

28. (original) A projector system for displaying an image on a viewing surface, said system comprising:

a light engine configured to generate pixels having gray scale levels to be displayed in corresponding pixel locations on said viewing surface; and

an ambient light sensor configured to measure an intensity of ambient light reflecting off said pixel locations on said viewing surface;

wherein said light engine is further configured to receive said measured ambient light intensity from said ambient light sensor and select between a half-toning algorithm and a dithering algorithm to generate said gray scale levels for each of said pixels based on said measured ambient light intensity.

29. (original) The system of claim 28, wherein said dithering algorithm is selected to generate said gray scale levels for each of said pixels that is to have a gray scale level at or below a predetermined threshold gray scale level if said estimated ambient light energy is greater than or substantially equal to said threshold gray scale level.

30. (original) The system of claim 29, wherein said half-toning algorithm is selected to generate said gray scale levels for each of said pixels if said estimated ambient light energy is less than said threshold gray scale level.

31. (original) The system of claim 28, wherein said dithering algorithm comprises spatially and temporally dithering pixel blocks during a number of frame periods, each of said pixel blocks comprising a plurality of said pixels to be displayed in said pixel locations in said gradual shading region.

32. (original) The system of claim 31, wherein said number of frame periods is equal to two.

33. (original) The system of claim 28, wherein said light engine comprises a spatial light modulator configured to generate said gray scale levels of said pixels.

34. (original) The system of claim 33, wherein said spatial light modulator is selected from the group consisting of an analog based light modulator, a pulse-width modulation based light modulator, a liquid crystal display (LCD) panel, a liquid crystal on silicon (LCOS) device, a diffractive light device (DLD), and an array of micromirrors.

35. (original) The system of claim 28, wherein said viewing surface comprises a contrast enhancing screen.

36. (original) A system for reducing a gray scale discontinuity between pixel locations in a blackened state on a contrast enhancing screen and pixel locations in a gradual shading region of an image displayed by a projector on said contrast enhancing screen, said discontinuity caused by ambient light, said system comprising:

means for measuring an intensity of said ambient light;

means for comparing said measured ambient light intensity to an average intensity of light projected by said projector onto said gradual shading region; and

means for generating apparent gray scale levels for pixels to be displayed in said pixel locations in said gradual shading region based on said comparison.

37. (original) The system of claim 36, further comprising:

means for selecting a dithering algorithm based on said comparison;

wherein said means for generating said apparent gray scale levels uses said dithering algorithm to generate said apparent gray scale levels for said pixels to be displayed in said pixel locations in said gradual shading region.

38. (original) The system of claim 36, wherein said means for generating said apparent gray scale levels for said pixels to be displayed in said pixel locations in said gradual shading region comprises:

means for spatially and temporally dithering pixel blocks during a number of frame periods, each of said pixel blocks comprising a plurality of said pixels to be displayed in said pixel locations in said gradual shading region;

wherein said means for spatial and temporal dithering of said pixel blocks generates an apparent gray scale level for each of said pixel blocks.

39. (original) The system of claim 38, wherein, during each of said number of frame periods, said means for spatially and temporally dithering said pixels comprises means for activating one or more of said plurality of pixel locations in each of said pixel blocks.

40. (original) A system for operating a light engine configured to project light onto a group of pixel locations of a viewing surface during a time period, said system comprising:

means for estimating an ambient light energy received by said group of pixel locations during said time period;

means for determining a threshold gray scale level of said light engine; and

means for dithering pixels having gray scale levels at or below said threshold gray scale level to be displayed in said group of pixel locations if said estimated ambient light energy is greater than or substantially equal to said threshold gray scale level.

41. (original) The system of claim 40, further comprising means for measuring an ambient light intensity, wherein said means for estimating said ambient light energy is based on said measured ambient light intensity.

42. (original) A system for operating a light engine configured to generate and display an image on a viewing surface, said image formed by pixels having varying gray scale levels, said system comprising:

means for generating an estimate of an ambient light intensity level; and

means for selecting between a half-toning means and a dithering means to generate said gray scale levels for each of said pixels in response to said estimated ambient light level.

43. (original) The system of claim 42, wherein said means for generating said estimate of said ambient light intensity level comprises means for measuring said ambient light intensity level.

44. (original) The system of claim 42, further comprising means for selecting a threshold gray scale level, wherein said dithering means is selected to generate said gray scale levels for each of said pixels that is to have a gray scale level at or below said threshold

gray scale level if said estimated ambient light energy is greater than or substantially equal to said threshold gray scale level.

45. (original) The system of claim 44, wherein said half-toning means is selected to generate said gray scale levels for each of said pixels if said estimated ambient light energy is less than said threshold gray scale level.

46. (original) The system of claim 44, wherein said dithering means comprises spatially and temporally dithering pixel blocks during a number of frame periods, each of said pixel blocks comprising a plurality of said pixels.